PERINATAL LESSONS FROM THE PAST

Stéphane Tarnier (1828–1897), the architect of perinatology in France

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Stéphane Tarnier studied medicine in Paris and became the doyen of obstetrics in France during the second half of the 19th century. He pioneered many advances and encouraged a perinatal approach to childbirth that was further developed by his disciples, Budin and Pinard.

Etienne Stéphane Tarnier, the son of a country doctor, was born at Aiserey, a small village in the Côte d'Or, on 29 April 1828.[1 2] The family then moved to Arc-sur-Tille where Stéphane grew up in a countryside to which all his life he remained deeply attached. After education at the Lycée of Dijon, Tarnier went to Paris in 1845 to study medicine. The following year he returned briefly to help his father during a cholera epidemic in the Dijon region. Once more in Paris in 1850, he qualified in medicine, and in 1856 entered the Maternité to gain obstetric experience before intending to enter general practice. While there though he became interested in the cause and prevention of puerperal fever, which at the time was claiming the lives of one in every six women delivered in the hospital. In 1857 Tarnier presented to the Académie his inaugural dissertation on this subject.[3] He showed that the mortality from puerperal sepsis was 13 times higher in the hospital than it was for women delivered in the district outside and stated his conviction that the disease was contagious. Such a suggestion was regarded as very controversial at the time, but his chief, Paul Dubois, was impressed and made him chief of clinic at the Maternité and then in 1867 surgeon in chief.

During the next 22 years under his direction, the hygiene of the hospital was improved; he introduced the isolation of infected cases and was the first in France to embrace Lister's antisepsis, including the carbolic acid spray, and a peritoneal exclusion technique for caesarean section. The mortality from puerperal infection at the Maternité fell from 93/1000 deliveries to 23/1000 in the period 1870–1880, and then to 7/1000 in the succeeding decade. Eventually 1000 consecutive women were delivered in the hospital without any maternal loss. Tarnier's studies over 40 years into puerperal fever were published in 1894.[4] In 1886 both he and Oliver Windell Holmes were made honorary LL.Ds of Edinburgh University.

In 1889 Tarnier succeeded Pajot as clinical professor of obstetrics in the University of Paris and became the doyen of obstetrics in France. Besides many research publications, he revised Caseaux's textbook of obstetrics, collaborated with Sée in the revision of Lenoir's obstetric atlas, and published his own *Traité de l'art des accouchments*. Among many important contributions was the introduction of his axis traction forceps in 1877.[2 5] He was well aware of the mechanical disadvantages of the forceps of Levret, then the standard instrument in use in France. His new forceps were designed to enable the operator to pull at all times in the axis of the pelvis, whatever the position of the head in the pelvic canal, and to allow the fetal head enough mobility to follow freely the curve of the pelvis. His forceps were not only convenient to use but reduced the amount of force required, and spared both the fetal head and the maternal tissues from unnecessary compression. They were widely used. Another instrument devised by Tarnier in 1883 was his basiotribe, which combined the advantages of Baudelocque's cephalotribe with those of Simpson's cranioclast. He also developed a method of inducing labour using an intrauterine balloon, in order to avoid the hazards that might arise from surgical rupture of the membranes.

Tarnier's observations on the management of the umbilical cord and on birth asphyxia are also of great interest.[6]

Figure 1 Stéphane Tarnier (1828–1897).

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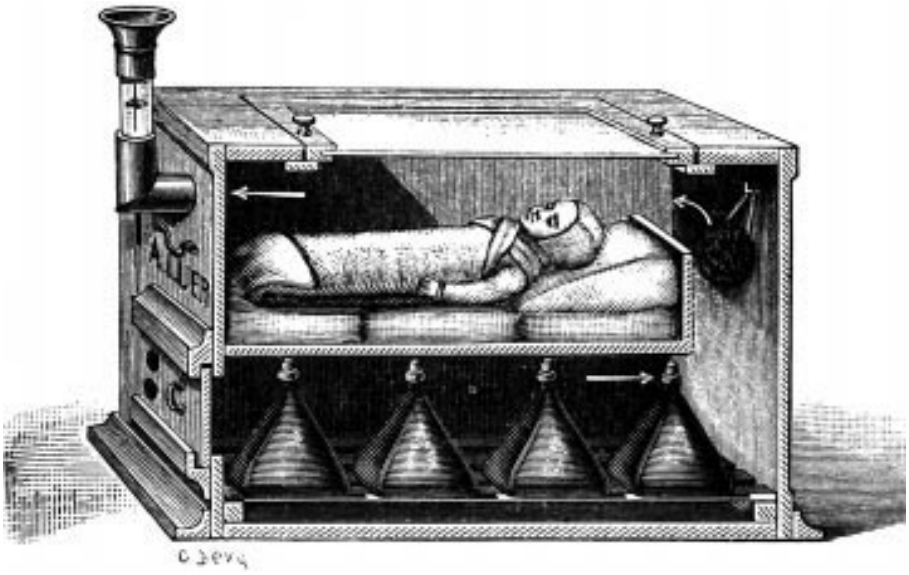

Figure 2 Tarnier's incubator, about 1883.

On cutting the umbilical cord[6]

> "When the child escapes from the mother's womb living, and in healthy state, the circulation existing between it and the placenta is observed to continue for some time where the delivery is abandoned entirely to the powers of nature; the after-birth is soon detached and expelled, and then it, as well as the cord, loses its vitality, the circulation becomes weaker and weaker, and the pulsations in the arteries gradually cease, commencing in the placental extremity; and some authors have advised this event to be waited for before cutting the cord; but as this spontaneous delivery most generally requires a long time, it is customary to make the section immediately after birth."

On the placental transfusion[6]

> "From experiments made by Budin, the amount of blood escaping from the placental end when the cord was tied immediately after the birth of the child was found to be about 3 ounces greater than when a delay of several minutes was allowed, which shows a loss of that much blood which would otherwise pass into the circulation. It has also been shown by Hofmeier and others that there is less loss of weight in the newborn infant when the cord is not tied until the pulsations have entirely ceased."

On blue asphyxia[6]

> " . . . the head is swollen and very warm, the lips are tumified and a deep blue colour; the eyes start from the head, and the tongue adheres to the roof of the mouth . . . the pulsations of the heart, though sometimes strong and distinct, are at others obscure and feeble; occasionally the umbilical cord is distended with blood . . . When the child . . . presents with the characters of the state formerly terms apoplexy, it is evident that the first indication is to relieve the engorgement of the head and lungs, which is done by promptly cutting the umbilical cord, and allowing a few spoonfuls of blood to escape, when the respiration is most usually established soon after . . ."

Perhaps Tarnier's most lasting contribution to perinatal medicine was his introduction of the incubator into the nursery of the Maternité in 1881 (fig 2). The following account is taken from Fraser[7]:

> "At the Paris zoo in 1880, on a visit to its director, Odile Martin, Tarnier saw in use an incubator (couveuse) for hatching the eggs of exotic birds, and persuaded Martin to make him one for premature babies. This was the first closed incubator for hospital use. Earlier some hospitals had been using the warm cradle introduced by Denucé in Bordeaux in 1857, a double-walled metal cot with warm water in the cavity but with no lid over the baby.
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> Tarnier's first incubator came into regular use in 1881 in the Maternité of Port Royal in Paris. Its thick wooden walls were filled with sawdust for insulation and the lower half was occupied by a large tank of hot water. The upper compartment was large enough to accommodate four babies in shallow baskets, with inspection through a double-glazed lid. Disinfection was by a solution of mercuric chloride 0.1 per cent. Early results were published by Auvard in 1883, showing that the survival of infants less than 2000 grammes in birth weight could by this means be increased from 35 to 62 per cent.
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> This original model was not preserved when it was soon superseded by smaller types which could more easily be moved and cleaned (Auvard 1884; Godson 1884). Glass walls were introduced for better observation of cyanotic attacks, and by 1895 the models in use strongly resembled those used in 1945."

The introduction of the gavage feeding of premature infants has also been attributed to Tarnier.

In 1891 Tarnier was elected President of the Academié of Medicine in Paris. He had been overworked for many years, and six years later he decided to retire. On the very day of his retirement he suffered a stroke, and died shortly afterwards on 22 November 1897. He was 69. So died a man who was loved by his pupils and worshipped by his patients. He had laid the

foundations of perinatal care in France. Perhaps though, his greatest contribution was in the men he trained, men such as Pierre Budin and Alphonse Pinard who took forward and developed his concepts. His colleagues erected a monument in his memory in the wall of the building where he had taught, later renamed La Clinic Tarnier.

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